

THE macdonald JOURNAL

JUNE 1976



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Editor: Gordon Bachman
Managing Editor: Hazel M. Clarke
Contributing Editors:
Joan Habel
Macdonald Reports
Tom Pickup
J. B. Roy, Agronome,
Information Division,
Ministry of Agriculture of Quebec
Business Manager:
Martin van Lierop

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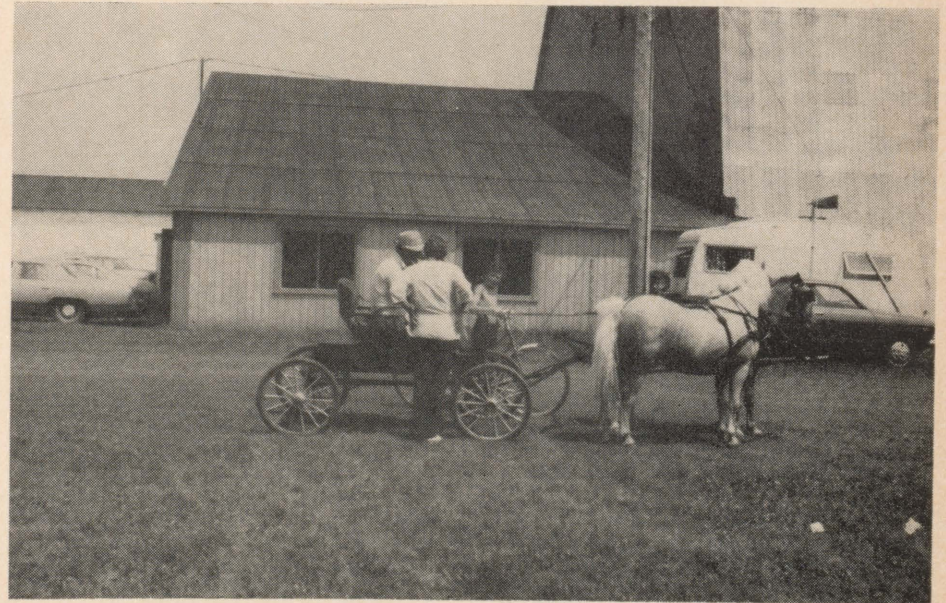
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Journal Jottings

Fair days aren't always fair, but they're always fun. Or almost always. My job keeps me desk-bound most of the year but last August 1st I thought I would start my holidays a day earlier by accompanying some of the Extension staff on their visit to Richmond Fair. I had listened with envy to my colleagues' reports of the fairs they had been to and knew of their keen anticipation of those ahead. At the least, I thought, I can be part of one "let's get out and meet the people" event. I think I met four people. And the one I was happiest to meet was the gentleman who was out behind the barn hosing down his Holstein and from whom I "stole" the hose and turned it on myself. When I was soaked from head to foot I returned to the Department's two-toned green van and found just enough energy to take a few photos — including the one on the cover and the one opposite. In Celsius or Fahrenheit that had to



be a record breaking scorcher of a day — I think it was well over 100°F in the barns and I swear it was 125° (at least) under our canopy. That was my day at the fair but that was last year and I hope this year, time permitting, to meet some of you at your Fair.

Meanwhile, Jim Feeny, on our cover, along with Joan Habel, seen here talking to Dennis Keenan of Richmond, and others will be out to see you as often as they can. May you all have fair days.

Hazel M. Clarke

On the Death of Professor Frank O. Morrison, B.A., B.Sc. (Agr.), M.Sc., Ph.D.

The Macdonald community has suffered a great loss due to the death on May 2, 1976 of Dr. Frank Morrison, former Chairman of the Department of Entomology.

Although Frank spent most of his working life at Macdonald College, he was an Albertan by birth, being born in Wetaskiwin in 1910. His early education was in Alberta and he first became associated with Macdonald College in 1937 when he came here as a Graduate Assistant in Entomology and began work towards his Ph.D. In 1939 he earned his Ph.D. from McGill and was appointed Lecturer at Macdonald College. From then on Frank served the College with dedication and efficiency up until the time of his death. Generations of students knew Frank by his shock of prematurely white hair, his white lab coat, and his ever ready amiable grin. I remember him being very amused when I told him the name by which the undergraduate students knew him — The White Tornado. I felt that the name was not inappropriate in that the controlled energy which he put into his work was of magnificent proportions. As a teacher, he was regarded by both undergraduate and graduate students with great respect and affection. He was unstinting in the time he put into class preparation and he was never too busy to discuss problems whether academic or personal with any student. Students readily recognized his combination of an excellent academic grasp of his subject and a common-sense application of information within the context of Agriculture.

He was a most productive and skilled researcher in his fields of Entomology and Toxicology, and he has numerous scholarly publications to his credit. His greatest forte, however, was his ability to inspire and direct graduate students in their research, and the number of entomologists in provincial and federal government service who have at one time worked with Dr. Morrison is a great credit to this ability.

Frank made many contributions to the university in other areas in that he worked long and hard on many, many university committees. It is difficult to think of a committee within the Faculty that he did not work on at one time. From 1972 until his half time appointment in the Department in 1975, he was Chairman of the Department of Entomology, carrying out his duties with efficiency, expedition, and at all times a humanitarian manner. To his colleagues within the Faculty, including myself, he was a sociable man always willing to shoulder far more than his share of work without complaint. He could always be relied upon to give help and sound advice. I am reminded of my arrival on campus when I was gardening next door to Frank in one of the Rivermead houses. He watched me sweat for an hour attempting to retrieve large boulders from the not too promising soil. He strolled over and said quietly. "Keep it up, boy! You'll soon get yourself a fine stone wall, but you won't have any garden left." I quickly learned that to be a successful gardener in

Quebec all one had to do was to watch carefully what Frank did, and follow suit. It is my impression that his graduate students applied the same technique to their research.

Frank's talents were well recognized outside the university. He was a Past President of the Quebec Society for the Protection of Plants, the Entomological Society of Quebec and the Macdonald College Branch, Agricultural Institute of Canada. The Entomological Society of Canada recognized his worth when they elected him Director of the Society for the year 1957-58.

I worked beside Frank Morrison for ten years and I lived beside him on campus for five. A better colleague and a better neighbour I couldn't ask for. At work I could go to him at any time, sit down, thrash out my problems and always get the right response. He was always steady under fire, and I never saw his temper ruffled.

Frank was a very strong family man and he and his wife, Nancy, were justifiably proud of their two daughters, Carmen and Diane, and of their granddaughter, Shena. To them, we offer our sincere sympathy. The Macdonald community will miss Frank Morrison for his intelligence, his energy, his solidity, and his good humour.

"Even his failings leaned to virtue's side." Burns.

Professor R. K. Stewart,
Chairman,
Department of Entomology.

A New Perspective

by David M. Bird,
Curator,
Macdonald Raptor
Research Centre

It has been four years since the empty shell of a poultry summer-house was converted into what is now known as the Macdonald Raptor Research Centre (MRRC). Much has happened in that span of time, including the adoption of a whole new game plan.

It was the ultimate intent of the Centre to bring into captivity some members of the northern race of endangered peregrine falcon for breeding and eventual restocking programs. The precipitous decline of this falcon in North America as a result of pesticide use is well-documented. The need for such a program was also realized by at least two other groups, notably Cornell University and our Canadian Wildlife Service. The brilliant and costly success of these peregrine breeding units has made it necessary for us to slightly alter our long-range goal in favour of a research program which complements those dealing specifically with the large falcons. Furthermore, it was also realized that the only real road to success in achieving conservation of birds of prey is a multi-faceted approach comprised of research, rehabilitation, and public education. All the research, captive breeding, and restocking in the world is absolutely worthless to birds of prey if mankind continues to extirpate them by destroying their habitat, poisoning them with pesticides, and shooting them with no real reason. Why save birds of prey? These birds are among the first wildlife species to exhibit the drastic effects of

toxic chemicals, thereby serving as valuable barometers of environmental deterioration. Furthermore, it has been shown time and time again that raptors are beneficial to farmers by controlling numbers of rodent, insect and bird pests.

A multi-faceted approach to this conservation task requires knowledge and expertise in several fields. The research team at MRRC includes Drs. P. C. Lague (Animal Science) and R. B. Buckland (Animal Science) specializing in reproductive physiology, Drs. R. Lemon (Biology) and R. Titman (Renewable Resources) concentrating on avian behaviour, Dr. R. Bider (Renewable Resources) working mainly in animal ecology, and myself in raptor biology. We have joined forces with the Hawk Cliff Raptor Banding Station at St. Thomas, Ontario to collect data on the migratory hawks and falcons trapped and banded there. In return, we have already completed a study on techniques to determine the age of female kestrels to enable hawk banders to study their longevity in the wild.

In general, the research program to date has gone extremely well. Reproductive physiology, a little studied aspect of raptorial birds, constitutes the main thrust. Since the winter of 1974, more than 100 kestrels, the smallest of North American falcons, have been raised at the Centre. One might ask, why breed these particular birds when they are relatively common in the wild? The answer is simple. By maintaining a pedigreed captive colony of a

highly reproducible nature, we are free to develop and test new concepts and techniques which may be applicable to the more endangered birds of prey. Since the kestrels and large hawks are readily available from zoos and other sources, they have become valuable research animals. Only two years ago, we acquired almost two dozen unwanted red-tailed hawks from the Metro Zoo in Toronto.

My two-year M.Sc. study on the practicability of artificial insemination in the small kestrel has now been completed with excellent results obtained. A total of 41 kestrels have been produced by artificial insemination. A Ph. D. is now underway to determine effects of various factors on egg and egg-laying characteristics in this species. Manipulation of photoperiod (length of daylight period) has enabled us to breed American rough-legged hawks and induce kestrels to breed three times in one year, both of which are **firsts!** The newest member in our group is Peter Tucker, an NRC scholar, who plans to study the effects of PCB's (polychlorinated biphenyls, chemicals dispersed upon formation and combustion of certain plastics) on kestrel breeding success. Indications from other sources are that PCB's in the environment may prove deadlier than DDT. Further research plans include the examination of sperm morphology by scanning electron microscopy as a possible taxonomic tool, and the monitoring of blood hormone levels in hopes of achieving hormone-induced breeding.

Although research is centred in the hawk barn situated in the northeast sector of the main campus, field studies have also been initiated. A two-year M.Sc. study by Stephen Spiegel on the characterization of kestrel nest sites has recently been completed. This information should prove invaluable to those engaged in putting up artificial nestboxes for this species.

Yves Prevost, another NRC scholar, is presently studying feeding ecology of fish-eating ospreys in Nova Scotia. So that the nocturnal raptors are not neglected, a five-year study on the movements in the Montreal area of saw-whet owls, a tiny bird five to six inches tall, is being carried out by several interested volunteers. Finally, with the successful kestrel breeding program now a reality, this spring the Centre is embarking on an experimental release project in rural areas. These birds are well-known for their predations on insects and mice.

Rehabilitation of sick and injured birds of prey is also being conducted at MRRC for the express purposes of releasing fully rehabilitated birds, utilizing those unfit for release, and developing new techniques for rehabilitation work. In the latter case, we recently contributed by inventing a new treatment for the foot condition in birds of prey known as "bumblefoot". "Bumblefoot" usually results from the entry of bacteria into an open wound or cut and the cure involves localized irradiation of the infected area from an X-ray machine kindly

provided for our experiments by the Royal Victoria, Montreal General, and Jewish General Hospitals.

To date, more than 60 raptors have been dealt with at MRRC in the rehabilitation program which leads me to the third facet of our program, that of public education. Public education is a long, hard road with very little immediate reward. If birds of prey are to thrive for our children's children to see and enjoy, then the public must be made aware of the need for their conservation. Certainly a rural landscape without a hawk soaring high above the fields must be somewhat dull!

Since the Centre began an official education program in August 1, 1975, more than 2,000 visitors from all over the world have entered its doors to view the displays and birds. The rather nominal admission fee provides funding for food and veterinary care for the birds held at the Centre. On many occasions we have ventured forth to meet the public by exhibiting displays at plazas, farm picnics, etc. It is important that farmers receive information concerning the beneficial aspects of birds of prey. In an effort to determine public attitudes towards birds of prey, we have formulated a questionnaire which will hopefully be expanded to the entire continent. Similarly, a pamphlet concerning conservation of birds of prey is being designed and distributed for public use.

Funding for our program has mainly stemmed from private foundations, McGill University, the Quebec government, and the World Wildlife Fund (Canada). In addition, we also won a White Owl Conservation Award of \$2,500 mainly for our public education efforts. A long-term financial arrangement has yet to be found.

In summary, the last four years have seen a great deal of change in the Macdonald Raptor Research Centre. Our new and thus far successful purpose is to develop and test concepts and techniques useful to those concerned with raptor management. By endeavouring to achieve this aim, the Macdonald Raptor Research Centre is playing an effective role in the preservation of birds of prey throughout the world.

The Influence of Stress on Poultry Performance

by Professor R. B. Buckland
Department of Animal Science

The word stress is one of the most imprecise terms used in connection with poultry production. The word "stress" is similar to the word "sin" in that they both mean different things to different people. As various groups of people have defined sin to meet their own needs, so we will define stress to meet our needs as it applies to poultry production.

With respect to poultry production and field application, I suggest that stress be defined as the term we will use for *all stimuli and conditions which can have a harmful effect on the bird.*

The question that immediately comes to mind is: how can a wide variety of stimuli such as heat, cold, crowding, ammonia levels, etc., all be grouped under the word stress? To answer this question and by way of introduction, I would like to briefly review the effect of stress on the body. The major effect of stress is the stimulation of the adrenal gland, with most work to date in poultry being done on the adrenal cortex. In Figure 1, I have outlined that stress affects the receptors and nervous system, and then the hypothalamus which, in turn, stimulates the pituitary to release ACTH (adrenocorticotrophic hormone). ACTH stimulates the adrenal cortex to release the glucocorticoids which are perhaps the main hormones with respect to having deleterious effects on not only poultry, but all types of animal production.

The effect of glucocorticoids tends to be longer lasting than the effect of adrenalin, from the adrenal medulla, which is

responsible for the fight or flight response.

In research on the problems of stress in poultry production, we must be able to measure quantitatively when an animal is stressed and how severe the stress is. This we can do by taking a blood sample and measuring the corticoid level. The more stress the animal has been subjected to, the higher the corticoid levels.

In Table 1, I have presented data collected at Macdonald College in our laboratories on the effect of various conditions and/or stresses on plasma corticoid levels. The lowest plasma corticoid levels were found after injection of the drug dexamethasone which inhibits the adrenal cortex

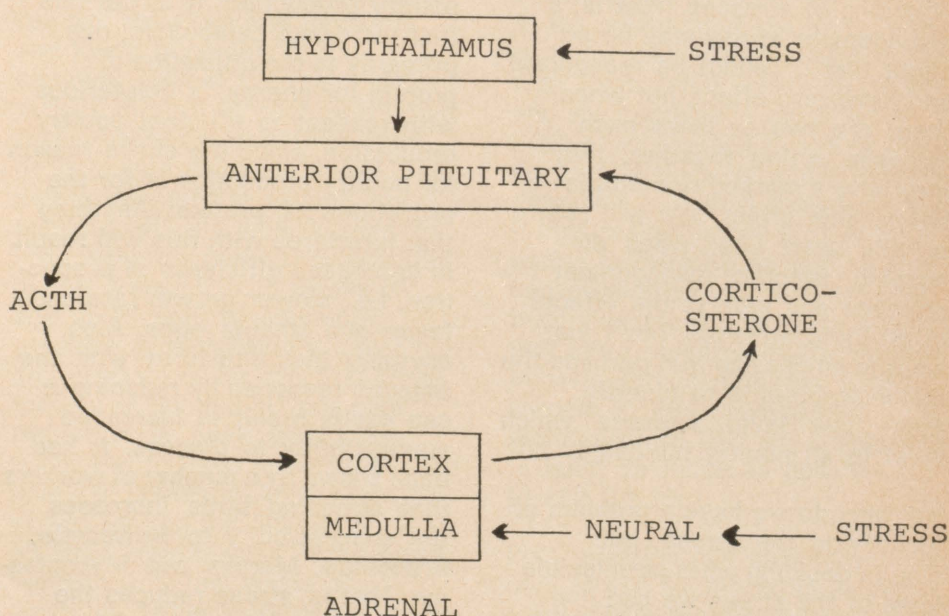
TABLE 1 — Effect of dexamethasone, stressors and ACTH on plasma total corticoid levels of 39-day old Leghorn chicks

Treatment	Total corticoid levels (ng/ml)
Dexamethasone injection.....	3.95 ^a
Control.....	6.77 ^{a,b}
Corn oil injection.....	8.71 ^b
Water withdrawal (48 hr).....	15.87 ^c
3 hr at 1.2°C (34°F).....	16.56 ^c
6 hr at 1.2°C (34°F).....	24.34 ^d
6 hr at 37.9°C (100°F).....	15.18 ^d
ACTH injection.....	81.82 ^e

^{a-e}Values with the same superscript are not significantly ($P > 0.05$) different

production of corticoids. Next we have the control birds and, thirdly, birds injected with corn oil to show that the handling and injecting of a non-stimulating material has very little effect on plasma corticoid levels. However, it can be seen that if the birds are without water for

FIGURE 1.



48 hours, a significant stress results, as does taking birds from a room temperature of about 70°F and exposing them to extremes of temperature. Similarly, with the injection of ACTH, which stimulates the adrenal cortex as per Figure 1, we have an extremely marked response as evidenced by plasma corticoid levels.

Table 1 shows the effect of a few stresses on adrenal response, but there is much more work to be done on evaluating the seriousness of the various management stresses encountered in poultry production. What we need to know regarding these stresses is the relative seriousness of each one, not only when acting singly, but also when acting in combinations. I maintain the real problem in poultry production today is not the problem of a single stress but the problems associated with combinations of stresses. That is, a management stress may be so slight that it cannot be recognized and have zero effect, but when there are two or more such stresses acting together, they may have a marked or multiple deleterious effect. We will return to this point later when discussing specific management stresses and look at the effects of multiple stresses, but I just want to emphasize that perhaps the major problem is to identify these low level stresses which exist in all poultry buildings.

Not only do we have a problem of identifying the stress, but also in deciding what permissible level of the stress we can live with. We must decide on a permissible level, because it is uneconomical to completely eliminate all stresses. Thus,

the poultry manager has two main problems. One is to *identify* the stresses and the second is to determine the *permissible* level.

After this introduction, I will now discuss why elevated adrenal corticoid levels are deleterious to efficient poultry production. I will then review the stresses encountered in poultry production and discuss their effects on production.

TABLE 2 — Reasons why stresses have deleterious effects on poultry production

1. High corticoid levels induce catabolism
2. High corticoid levels interfere with immune response
3. High adrenalin levels reduce blood flow to digestive tract and oviduct
4. The more susceptible birds are to stress, the more nervous they are
5. Injecting high doses of corticoids has resulted in ovary atrophy

In Table 2, I have listed some of the known deleterious physiological effects of increased plasma corticoid levels with respect to poultry production. It is obvious that increased catabolism, due primarily to the utilization of protein for energy, is deleterious with respect to efficient poultry production, since the entire reason for poultry production is for the production of protein. Anything that interferes with this will result in decreased efficiency of production, i.e., slower growth rate and fewer and smaller eggs. Also, anything that interferes with the immune response by reducing it can easily result in increased susceptibility to disease. It has been shown by a number of workers that stressing birds increases the susceptibility to Newcastle, Bronchitis, Mareks and Mycoplasma. That is, stress reduces the resistance to viruses and Mycoplasma. On the other hand, subjecting birds to stress has

been shown to increase the resistance to bacteria such as *Escherichia coli* and *Staphylococcus aureus*. It has also been shown that high corticoid levels seem to result in more resistance to Northern Fowl mite. However, bacteria and parasite infections can be fairly easily treated with antibiotics, etc., whereas viral and Mycoplasma infections are more difficult to treat. Thus, we should be concerned with reducing the stresses to help increase the resistance to viruses and Mycoplasmas which are more difficult to control.

With respect to the effects of adrenalin, which is the hormone responsible for the fight or flight syndrome, the major effect is to direct the blood flow to skeletal muscle, readying it for fight or flight, and reducing the blood flow to the digestive tract and the oviduct. Work at Edinburgh, Scotland, has shown that the oviduct receives about 20 per cent of the heart output and that each egg contains about five grams of calcium. Therefore, a stress which results in restricted blood flow to the oviduct could thus restrict the calcium supply, and thus shell quality. This may be part of the reason for poorer shell quality in hot weather. Similar poor blood flow to the digestive tract could result in reduced feed adsorption.

At the University of Ohio, there are lines of turkeys differing in their responsiveness to stress, i.e., one line is very responsive and one is not. It has been observed that the high response line is more nervous. Thus, it is reasonable to extrapolate that stresses will tend to make all birds more nervous and excitable.

It has also been shown through administering high doses of corticoids and through developing high and low plasma corticoid lines through genetic selection, that high corticoid levels interfere with ovary function. In fact, high levels have been shown to cause hypertrophy of the ovary.

In Table 3, I have listed some of the common stresses that are associated with poultry production. This list is not exhaustive, and many poultry managers will be able to add to the list. I will now discuss the effects of these stresses on poultry production.

TABLE 3 — Some common stresses associated with poultry production

Temperature
Poor ventilation
High population density
Nutrition
Disease
Handling
Debeaking
Food and/or water deprivation
Introducing birds to existing social group
Heavy production

In addition to seeing earlier in Table 1 that temperature extremes are a stress as measured by plasma corticoid levels, it is also well documented that high temperatures result in reduced egg production, shell quality, and feed intake, with the reduction in feed intake not completely accounting for the decline in egg production and shell quality, and the possible involvement in this regard has already been discussed. For example, work reported by the University of Utah has shown that birds held at a constant temperature of 65°F laid at an average rate of 79 per cent, whereas birds kept in a temperature that fluctuated between 70° and 100°F only laid at 71 per cent. This work and other work on broilers, along with stress physiology studies in a

number of species, suggests that temperature fluctuations may be more of a problem than extremes.

The work with broilers examined the effect of daily temperature fluctuations of 0°C, 5.5°C, 11.1°C and 16.6°C on body weight. The results indicated that birds grown with daily temperature fluctuations of 11.1°C and 16.6°C were significantly lighter than those grown with a daily fluctuation of 0°C which indicated that temperature fluctuations were a stress. However, the birds grown with a temperature fluctuation of 5.5°C weighed the same as those grown with no temperature fluctuations, so one can say that temperature fluctuations are a stress and that for broilers 5.5°C is a permissible level. This is a good example of identifying the stress (temperature fluctuations) and determining the permissible level (5.5°C).

Regarding ventilation, the objectives are to supply oxygen, to remove moisture and ammonia, and to aid in cooling in the summer. One of the major deleterious effects of poor ventilation is manifested through the effect of increased ammonia levels. The deleterious effects of high ammonia levels are well documented. For example, growing replacement pullets from 11 to 18 weeks of age at 78 ppm of ammonia resulted in significantly lower egg production for the first three months of lay and six per cent reduction in peak production, compared to birds grown with zero levels of ammonia. After 18 weeks of age, during the laying period all birds were housed in the same building with low levels of ammonia. Other work on the effect of ammonia levels for birds during the laying period shows that 52 ppm of ammonia results in a six per cent drop in egg produc-

tion, and 105 ppm of ammonia results in a 13 per cent drop in egg production compared to the control birds over the full laying year.

Bird density can be a very severe stress, and this fact again has been well documented. For example, housing layers in cages at either 60, 72, 84 or 96 square inches per bird, it has been found over the test period that birds housed at 60 square inches per bird laid 270 eggs, while birds housed at 72 square inches laid 279 eggs and at 84 square inches, 281 eggs per bird, while birds at 96 square inches laid 283 eggs. Again, one must decide on the acceptable or permissible level of the stress which is related to reducing the fixed cost per bird to as little as is possible by the utilization of high housing densities.

These effects of bird density on egg production as seen here, for example, are probably really due to the crowding of the birds. That is, the birds are in continual contact with each other when crowded and are continually intruding on each other's space to eat or drink. Further, if there is a particularly dominant bird in a crowded cage, it may prevent other bird(s) from eating or drinking enough so that egg production will decline. It is becoming more and more obvious that more research by the poultry behaviourist is required with respect to new management techniques so that the equipment is built, as much as possible, to suit the bird.

Poor nutrition can obviously result in a stress on the birds to the point where maximum production is not realized. At this time I will not say more about this point as

the subject is extremely specialized and should be handled by a poultry nutritionist. At the practical level, I can only urge every producer to be sure to deal with a reputable feed company and feed outlet, and emphasize that poor nutrient input results in reduced product, but that wasteful feeding should not be practiced.

Disease in poultry is a stress. The most important point here is to practice preventive medicine, not only from a veterinarian point of view regarding vaccination programs, etc., but also regarding management. For example, some work was done at Michigan State on the effect of various ammonia levels on the susceptibility to Newcastle virus. The workers showed that exposure to 20 ppm of ammonia for 28 days would result in no clinical lesions in the birds. However, if they exposed one group of birds to 20 ppm of ammonia for only three days and another received no ammonia at all and then both groups were exposed to Newcastle disease, it was found that among the birds exposed to ammonia 70 per cent were infected, while among the control group only 36 per cent were infected. This points out the importance of management stresses in relation to the susceptibility to diseases, and figures on the loss of production due to disease are not necessary as everyone is aware of the financial losses that can occur.

Handling and debeaking are other factors that can cause stress to the birds. The most important point to keep in mind with respect to such stresses is to try to perform the necessary tasks so that the birds are stressed as little as possible. In this respect, good help

is mandatory and also to work with the birds such that they receive no more than one or at the most two stresses at one time. For example, do not debeak the birds on extremely hot days. Do not transport and keep them without water on extremely hot days. We have already seen where no water for 48 hours results in a significant stress on the birds. As mentioned previously, the area of quantitating the stressfulness of such things as debeaking needs further research, particularly in the area of combined stresses.

Dr. Paul Siegal at the Virginia Polytechnic Institute has done a lot of work on social stress, and he has shown that introducing birds to new areas and to new pens so that they have new pen mates is a very significant stress based on adrenal response. Dr. Siegal and co-workers have also shown that stressing birds by rotating individuals from pen to pen for a period of two weeks results in increased susceptibility to Marek's disease. The effect was much more noticeable among a line of birds which had a high output of adrenal steroids than for animals which had a low output.

It is perhaps not often that we think of high production as a stress. However, it is, and this point should always be kept in mind. High production can be thought of as a stress because it can have a harmful effect on the bird, because a high producing bird is channeling a very large proportion of its resources to production and has very little left to combat other stresses it may encounter, and so is more susceptible to other stresses than lower producing birds.

By way of summary, I will review some work by Dr. Keith Brown at the University of Ohio. Dr. Brown, with Dr. Nestor, has been selecting for a number of generations a line of turkeys that has a low adrenal response when stressed. Dr. Brown started this work based on the hypothesis that the low response birds should be heavier, because of less catabolic effects, and have lower mortality because of less interference with the immune response. Through seven or eight generations, Dr. Brown has found that the low line birds are heavier, have less mortality, and lay more eggs than the high line. Also, the low response line have been selected for low response to cold stress but have been found to be low responders to other stresses as well, such as heat. This indicates birds resistant to one stress should be resistant to all stresses.

With Profit for the Organizer and Satisfaction for the Customer

Many of our readers at one time or another find that they are faced with the task of preparing, helping to prepare, or organize large quantities of food. Steve Olive, a B.Sc. graduate in Food Management from Macdonald College and his staff of 23 face this situation every day. They serve from 12 to 1,500 Macdonald and John Abbott students and staff in Macdonald's main dining room. It's open Monday to Friday from 8 a.m. to 6 p.m. and is on an a la carte basis. The bulk of the service is during the noon hour period because of the large number of commuting students at John Abbott, and the majority of business is the so-called short order service — hot dogs, hamburgers, sandwiches, french fries, pieces of pie and cake. The students, according to Steve Olive don't have time for a full-course meal, but they may eat small amounts from four to six times a day. "It worries me in a way that people are not being thoughtful about what they eat," Steve said, "but you have to remember that we are feeding active, healthy people who tend to go to high energy foods. And," he emphasized, "if someone is conscious about nutrition, the student can get what he needs at a fairly reasonable price." But the final choice lies with the student and not with the establishment — people are demanding what they want and not what other people think they should have.

I asked Steve Olive for his comments on quantity cooking based on the cost of the product with a view to a profit for the organizer. I realize that many members of the Women's Institutes, for instance, give not only their time and labour but also the already prepared foods for the various events for which they

cater. However, I think you may find a handy hint or two to try the next time a member calls and says, "We've been asked to provide food for a 'do' next month."

Hazel Clarke

Could you discuss planning the menu, and I think we should base our discussions here on profit-making projects.

Steve Olive: As a general rule have a menu where a large part of it can be prepared beforehand. If it can be frozen, so much the better. If you are serving hors d'oeuvres, things like cocktail sausages and pigs in blankets can be prepared ahead, partially cooked, and frozen. The work can be done in the peace and tranquillity of the home or a kitchen where a committee can work. On the day it's an easy matter to put them in the oven to heat and then serve. You're not faced with an extra long day for your caterers, and it keeps the work load and confusion down to a minimum. There are many things that could be put into this category. For example, we make miniature quiche lorraines for receptions. They can be frozen and reheated. You can keep track of these items in terms of numbers and, looking at the profit side, you make up so many, you know how much it costs to make them and you can, therefore, set a reasonable selling price and know that you are making a profit.

With salads, for example, it is nearly impossible to judge quantities — you never know how much you will sell. If you over-purchase, you tend to get a lot of wastage, or if it's a hot summer day, people will eat more. You lose control of the cost. Often salads are necessary but the other

foods prepared ahead, if possible, help you to keep on the profit side.

What profit should a group aim for?

Steve Olive: With volunteer labour, I think you would aim for 35 to 40 per cent and be happy with 20 per cent. Inevitably there are losses and wastages that are unpredictable.

Would you have just one or two people buying the food?

Steve Olive: Very definitely. If one person is going to make the tortieres, for example, and she buys the ingredients, the amount of work involved in figuring out how much she has to be paid for her material, how much she actually used and how much she put in from her own cupboard is difficult and time-consuming. At the committee meeting have the "cooks" hand in their recipes or requirements for materials. Instead of having four or five people buying small cans of baking powder you may find that you need one large can for the whole outfit. Dole out the baking powder — you don't have to be accurate, but buy big cans. It saves money. People are putting in their time, let them put in their time as economically as possible.

If Mrs. C. is making 14 gelatin fruit salads and Mrs. D. is making 14 gelatin vegetable salads, why not buy all your gelatin in one big package and divide rather than buy a whole lot of little packages — you're paying for the packaging.

If your "buyers" know that an event is coming up, have them

watch for specials, particularly if you have freezer space.

Cakes, pies, and pie and ice cream are popular desserts. Pies and cakes can be made beforehand, are easily cut, and you can count the pieces. Ice cream is easily controlled and served. If you have a scoop and are allowing a wedge of apple pie and a scoop of ice cream, you know how much it costs and exactly what people get. I mention this now because, if possible, you should try to buy the ice cream in bulk — not the half gallons where again you are paying for the packaging. If you are serving 200 people, buy 2½ gallons of ice cream from the dairy. It should be a great deal cheaper.

If possible, try to buy individual creamers. They're much more convenient, easy to handle, and you have no jugs to wash. They can be bought in minimum size boxes of 100, so if you can use that many, great. There's no wastage.

Sugar can be bought at a minimum of 1,000 envelopes at a time. If you can buy these in bulk and use them, do so. Once a five-pound bag of sugar is open, it's susceptible to moisture, to insects, etc. You may keep it to use on the next occasion only to find it's a solid lump or crawling with unwanted visitors, or the vicar has run out of sugar for his afternoon tea and he's borrowed it from the church hall cupboard.

Once the buyers have bought the ingredients, it's up to the "cooks" to stick to the recipe?

Steve Olive: Yes, you have to be practical about looking at the cost and say O.K. we are projecting a selling price of this; now we have got to stay with it. Don't say, that would be nice to put in the meat pie and throw it in. It may make it taste better, but if the organizers

plan to sell an item for 50 cents, you can't put 47 cents worth of material into it. If you've told the consumer that you are going to offer a full-course meal for \$1.25 and you find you put \$1.00 worth of material in, you're in trouble, and you can't change the prices. Write a menu, have specific recipes, and stick to them. If you don't like the recipe, alter it next time and plan for the increased cost. Then you won't have the organizer saying, "why did we lose money?"

A classic example: we used to have butter available on the counter — you could have as much as you wanted. Now for 72 pats of butter in a pound we're paying 97 cents — that is over a cent a piece. If every one of our 12 to 1,500 customers took one extra pat of butter too much, there's \$15 gone in one meal. It adds up quickly.

This is one of the biggest problems in quantity cooking. You have to either set the price to compensate for a healthy serving or set it on the basis of a serving size and stick to it. And make certain that you charge enough. People have to accept the reality of the fact that the cost of food is not what it was five years ago; it's a great deal more. The cost to volunteer teams working at church bazaars or county fairs is no different than the cost to anybody else and as a result people have to pay accordingly. If anyone says, "but it was that last year and we really can't raise it too much this year," it's very false economy. It's kidding yourself and it's kidding the people who are coming to your functions. Something has to give somewhere — either the function ceases to exist or else the quality becomes very poor.

What about organizing the work load?

Steve Olive: Get a lot done at home. The fewer people you have

actually involved in the serving at the time the better off you're going to be because everybody then knows that they have a specific job and they just keep working away at that job. Life becomes, for me anyway, much less complicated. I would sooner attempt to serve 200 people at a buffet with three or four people behind the counter than serve 50 with three or four because for 50 there's not enough work to go around. As a result people get to talking. Do the job first, and quickly, then you can have all the time to socialize afterwards.

Don't have the dishwashers come in until after the meal is over. If they come earlier, they may stand around doing nothing and possibly disrupt people who have jobs to do. Let them come later, get the job done, and then socialize.

At least once a year we hear of a case of food poisoning at a picnic, reception, or other event. Would you discuss the care needed in handling food? I don't think we can repeat this too often.

Steve Olive: There isn't an overall solution to the problem other than as you say care. Menu choice, I think, can make a big difference. If the food is going to have to be out in hot weather for long periods, stay away from such things as chicken, chicken by-products, eggs, mayonnaise. Salmonella grows very quickly and is one of the commonest forms of food poisoning. Stay away from these and you are going to stay away from the problem. Devilled eggs always look great, but if they sit for two or three hours in the blazing sun or even under canvas the chances of getting some sort of off taste is going to be high.

The one thing to remember is that things that smell bad, chances are are bad. If food tastes and smells all right, then 99 times out of a 100 it is going to be all right. If it smells bad, throw it away. It's

a waste but less of a waste than someone getting food poisoning. The only poisoning that I am aware of that doesn't have a bad taste and you have to be careful of is things you can get from cans. But it is apparent. When you open a bad can, there is going to be an expulsion of air or gas from that can. There won't necessarily be a bad aroma — very often there will be some degree of fermentation such as bubbles forming like the bubbles in ginger ale. Again stay away from it. Take it back to the grocer. Don't use it.

Now let's get down to the subject of food and specific events. What about catering for a fair or other large event?

Steve Olive: I think that snack tents are much more profitable than complete meals, but we'll discuss both.

There should be practically no wastage with a snack tent set up. The so-called convenience foods — hot dogs, hamburgers, mini pizzas, ice creams — are easy, quick, and popular, much more popular than a lot of people would think.

Think about tacos. If you had a taco stand at a county fair, you could really sell. It's different. It's off the normal track of menu ideas and so people are going to say "Wouldn't that be fun to try." You can either buy the taco shells or have someone make them. They're a little time-consuming but not hard to do. They can be made ahead and filled as they're ordered. You can keep 10 or 20 servings ahead all the time. The rest of the hamburger is raw and you're not wasting. You're not cooking stuff that you'll have to dispose of if it doesn't sell.

For the complete meal type of set up, I would tend to lean, if you have a lot of men involved, to the rib stickers — a beef bourguignon, beef stew on rice, in patty shells, or with noodles. This will fill the men up.

For the ladies you could go to the cold meat platters or salad plates with little jellied salads. Again, things that can be prepared ahead. You can make up a whole raft of jellied salads in little yogurt containers. They make a beautiful, one-portion size jellied salad.

You are staying away from roast beef and turkey.

Steve Olive: Very much so. If you consider the cost to return ratio for turkey, you are talking about a 50 per cent overall loss. The edible portion on a turkey is somewhere around 50 per cent, on a chicken, it's even less, around 38 per cent. If roast beef isn't cooked just right, you can lose up to 30 per cent on shrinkage alone in the oven. And if you have volunteers workers who work very hard but don't have professional training in portion size, it can get very confusing and difficult. Some can, but it is hard to maintain control on what is served. If you have 200 people and had originally planned on a five-ounce serving of meat and wind up serving six ounces, you're talking about 200 extra ounces, which is somewhere around 15 pounds. At \$2 something a pound, you've thrown a lot of money out the window just being a little extra generous on the serving and there may go an organization's profit.

For cold meat platters, I would suggest ham slices rolled around asparagus spears and spicy luncheon meats. There are a whole range of salamis and sausages with different spices. For a mid morning or mid afternoon function I would allow two to two and a half ounces (total) per person. If the function is at a meal period, one might need as much as four to five ounces per person. I would also provide a large selection of bread and lots of it. It's cheaper to fill people up on bread than expensive meat.

Sit down meals have got to be well planned and kept simple. If you get into three or four choices and publish a menu, you can run into problems. Someone reads your menu early in the morning, checks your meal hours — 11:30 a.m. to 2:30 p.m. — and decides you will be serving something he would really enjoy. He returns at 2 o'clock and you've run out of that item. He'll be disappointed and possibly bad publicity will get around. If you say you're going to have french pea soup and baked beans — or some other fixed menu — that's fine. But you can run into problems here, too. Mainly wastage. For example, it's a fall fair and you're pushing soup, tortiere, or some sort of meat pie or meat dish, bread and butter, dessert, and a beverage. You've had enough meat pies on hand for your projected clientele. The soup is going to hold as long as you have a fridge or freezer. The same applies for most desserts. But the one thing that has cost you the most money is the one thing you could wind up getting into trouble over. You may have to sell the leftovers at cost, or slightly below, and there goes your profit.

What about soups. Would you start a meal with soup or tomato juice?

Steve Olive: If possible, particularly when you consider the cost, I would serve soup. If a member of the organization has a family recipe for a good, hearty soup, great. Now the only consideration is utensils. You have to have a vessel to hold soup, whereas with anything else you can always make do. If you don't have the china available, you can use styro-foam soup bowls, but it's got to be eaten very quickly. If you have the facilities, by all means serve soup because it is always popular, especially in cold weather, and it's a great deal cheaper than juice. A seven-ounce serving of tomato juice probably costs six to

seven cents, and you can serve 10 or 12 ounces of soup for the same price.

Could we talk just a little more about buffets here.

Steve Olive: This applies to any meal — stay away from the esoteric when serving a large number of people. Stay with simple, well-prepared, tastefully presented things and you'll be much more successful.

A dish of scalloped potatoes lends itself to this. There's a nice crust. The visual effect, even as you cut out a portion, doesn't change. On the other hand, a large jellied salad looks nice for the first two or three people, but once you have got to the fourteenth or fifteenth person it looks tired and chances are it will sit until the end of the meal and nobody will have any because it doesn't look appetizing. People eat with their eyes.

There is nothing worse at a buffet than having something to eat for which you have to use a knife and fork. Stay away from the two utensil things as much as possible. Trying to cut meat and even certain types of french pastry, for example, can be a problem. If you were sitting at a table, fine, but you're trying to balance your plate on your lap and cut into a mille feuille and you get your neighbour — not so good. These are the basic guidelines that people have to try and remember.

Take sandwiches. Many people get very uptight and say "not sandwiches again." I know of at least 20 different ways to cut one square sandwich. Use your imagination; maybe there are more. The important thing to remember when making sandwiches is don't be skimpy with the fillings.

There's an infinite variety of things to do with rolled sandwiches. You can have a whipped cheese filling with an olive core. With a

maraschino cherry core, a gherkin core, a cocktail onion core. Slice these up and you have a different taste sensation all the way down the line from the same basic sandwich. If the ladies are interested in a very simple and quick hors d'oeuvre (it sounds atrocious but is delicious and popular), 50-50 peanut butter and corn relish mixed together and a little dab put on a cracker.

You can put on an extremely good reception for 50 people under 1.00 a head. This is strictly for food, cost price to the organizer. You sell it for \$1.45 to \$1.50, which at today's prices is not out of line.

Have potato chips or any of the myriad variety of crackers that are available now with some dips made from yogourt or sour cream. You can make a nice onion dip from yogourt and dried onion soup mix with a little garlic and perhaps a little curry powder added. Inexpensive to make, even less so if you are making your own yogourt.

Have a selection of sandwiches; allow three-quarters of a sandwich per person, i.e., 1½ slices of bread per person over 1½ to two hours if it is a mid morning or mid afternoon reception. This is critical when planning a reception — if it falls at meal time, then you have to allow more.

Have along with the sandwiches a selection of green and black olives, gherkins, cocktail onions, sweet and sour pickles, carrot curls, radish roses, celery hearts stuffed with a little whipped cheese. Use these as garnishes; they add to the overall appearance and add another taste sensation. If you want to go to something sweet, you are going to have to up the price a little but, if not, then go with tea and coffee. For sweets have butter tarts or mince tarts, butterscotch squares, brownies. Everyone thinks mince tarts are for Thanksgiving or Christmas.

Have mince tarts any time of the year; they're great. A nine-ounce cup of coffee with cream and sugar costs seven cents to produce, including labour. On that basis, a non-labour organization can figure on 10 cents for a cup of coffee as a reasonable selling price in a package deal. An individual cup of coffee is different. If you are setting up a coffee and tea stand at a fair then you could charge 20 cents for a cup of coffee or tea. I would suggest 25 cents for a cup of hot chocolate. Anything more is, I think, out of line.

Would you use some of the instant foods; the convenience foods? Say instant mashed potatoes?

Steve Olive: No, don't touch them. The difference in a commercial set-up and a group of volunteers is labour. Labour costs the money, not the product. If you have volunteers to help wash, peel, and mash the potatoes, then I don't think it costs more; it probably costs less and you have a superior product. You can buy frozen, preformed hamburger patties, but a pattie made out of fresh ground meat has juices in it. It's just got more flavour.

Some convenience foods and packages, however, are handy. Ice cream might cost a little bit more but at a snack counter I lean towards little sundaes, drumsticks, ice cream sandwiches. They're popular with the kids, nutritious, and not too expensive. They may cost 13 or 14 cents to buy, and you sell them at 19 or 20 cents. Ask the dairy when you put in your order to provide you with dry ice to keep them cold.

To sum up, think of food that you can prepare beforehand, that you can control the cost of, and control how it goes out. If you know your costs and set the price accordingly, you're going to make money and you're going to have satisfied customers.

The Family

Farm

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Basic Principles of Weed Control

by Jean-F. Bertrand,
Jean-Louis Dagenais,
and Michel Perron

To begin with, it is essential to solve the fundamental problems of growing a good crop before tackling the problem of controlling the weeds. This means that the cultivated plants must be provided with optimum conditions for growth so that they will be better able to compete with the weeds. The growing medium, i.e., the soil, must therefore first meet the following basic requirements: good drainage, optimum pH, and adequate fertilization.

Does it pay to apply a herbicide? The following table shows that a herbicide treatment which destroys weeds that would otherwise have reduced the yield of the crop by 15 per cent is profitable. (Incidentally, weeds often reduce crop yield by much more than 15 per cent).

Good weed control leads to increased yields, better quality, higher returns, decreased weed infestation and better use of soil, water and fertilizer.

Apart from the use of chemicals (herbicide applications), weed infestation can be reduced by certain growing methods and various preventive measures and other precautions. In general, a constant and sustained effort is needed to combat the introduction and multiplication of weeds.

A. Preventive Measures

It is absurd on the one hand to be spending money to destroy weeds and, on the other, to be doing things that help them to spread.

1. The Use of Certified Seed (blue label) in the first place is a good way to avoid introducing and multiplying weeds. Like all pedigreed seed (foundation, registered, and certified) certified seed is governed by the (federal) Seeds Act, and the kind and quantity of weeds in it have to be very small and are known by the seller. For example, No. 1 grade certified seed must not contain more than five (or 0.03 per cent) of "foreign" seeds per pound. By way of comparison and to show how the use of feed grains for seed helps to spread weeds, we might mention that

3CW oats may contain up to six per cent (or 950 per pound) of "foreign" seeds, including 600 seeds of wild oats per pound (i.e. four per cent).

2. Elimination of weeds from the borders of the field and in neighbouring fields is also very important because those weeds produce seeds which can easily be spread by wind, water, and farm implements. In addition, such places harbour many insects and diseases that multiply and eventually damage the crop. The (provincial) Agricultural Abuses Acts decrees that the owner, occupant, or person operating any land, ground, or lot must destroy the noxious weeds thereon which are considered as such by order of the Lieutenant-Governor in Council, before the seed ripens. In case of failure to comply, an inspector appointed by the municipality at the request of a stipulated number of rate-payers may have the weeds destroyed.

3. Gathering up combine screenings, clipping pastures and cutting forage crops earlier all help to reduce the spread of weeds. If we allow the seeds produced by weeds growing in the fields to fall to the ground, we are simply letting the weeds re-sow themselves. Moreover, a single weed plant may produce over 1,000 seeds (see Table 2).

TABLE 1. Estimated savings from prevention of a 15 per cent reduction in cereal yields by means of a herbicide application.

Crop	Average Yield Bushels/Acre	15% Reduction in Yield Bushels/Acre	Financial Loss from 15% Reduction	Cost of Herbicide & Application	Saving
Oats.....	40	6	$6 \times \$1.95^* = \11.70	$\$1.25 + \2.50	\$ 7.95
Wheat.....	45	6.7	$6.7 \times \$3.95 = \26.46	$\$1.25 + \2.50	\$22.71
Corn.....	70	7	$10.5 \times \$3.04 = \31.92	$\$14 + \2.50	\$15.42

*Montreal prices (truck deliveries) March 3, 1976.

TABLE 2

Kind of weed	Number of seeds produced by one plant
Wild mustard.....	3,000 to 5,000
Ragweed.....	4,000 to 6,000
Wild carrot.....	5,000 to 10,000
Dandelion.....	10,000 to 15,000
Burdock.....	30,000 to 40,000
Plantain.....	50,000 to 60,000

To prevent weed seeds from reaching maturity it is important to cut hayfields early and clip the plants left uneaten by the animals in the pastures. In grain fields the screenings, which contain most of the weed seeds, must be gathered up and destroyed.

Thanks to these preventive measures, the introduction of new weed seeds into the fields — with the consequent risk of serious infestations — can be considerably diminished.

B. Growing Methods

If seeding is done early in spring, good weed control is very important. As many weeds emerge from the ground at that time of year they may easily get ahead of the crop.

Farming practices and operations such as summerfallowing, mowing, and cultivation are used to exhaust the reserves of weed seeds in the soil. It takes several years to rid land of weeds adequately; hence the great importance of taking the preventive measures to avoid any fresh contamination of the soil.

Repeated cropping or monoculture is now becoming increasingly

common. This often leads to decreased yield from different causes, including loss of the organic matter in the soil, compaction of the soil, poor soil structure, and multiplication of specific weeds. To avoid these problems, it is recommended that an adequate rotation be introduced. As a result of the ensuing different cropping and soil management practices and the wider range of herbicides used, these specific weeds may be got rid of. An excellent example of this is the alfalfa-corn rotation thanks to which couch grass and other weeds can be controlled.

C. Chemical Methods

Because of the quantities of weed seeds already present in the soil, it is nearly always necessary to resort to herbicide treatments in order to have clean fields. It must always be remembered that herbicides are chemical substances which, when applied correctly, are very useful. On the other hand, a poorly applied herbicide spray may have no effect on the weeds and may even seriously injure, if not destroy, the cultivated plants. It is therefore very important to make sure that the application is done properly. Various precautions are necessary:

1. Identification of weeds

The choice of herbicide depends not only on the kind of crop plants to be protected but also on the weeds to be destroyed. Thus it is necessary to "take inventory" (so to speak) of the kinds of weeds in the field. In the case of post-emergence sprays, the ideal

procedure would be to take this "census" in spring when the weeds are sprouting from the ground. Failing such first-hand identification of the weeds in his field, the farmer may judge what to expect by recalling the mature ones he noticed in his crop the year before.

2. Choice of herbicide

Depending on the kinds of weeds present, a single herbicide or a mixture of herbicides may be used. There are tables which show the vulnerability of various kinds of weeds to different herbicides. Generally speaking it may be said that the more kinds (i.e., of weeds and of crop plants) there are in the field, the more limited will be the choice of herbicide.

If a mixture of crop plants is being grown (e.g. cereals with legumes or grasses with legumes), it is important to check the vulnerability of each kind to the herbicide(s) one is considering using.

3. Read the Label

The (federal) Pest Control Products Act compels the herbicide manufacturer to print on the label certain important information about the product he sells, including the following:

- a) the common name or the chemical name of the active ingredient in the product;
- b) the amount of active ingredient in the product (i.e., the content expressed as percentage by weight or in terms of weight per unit of volume);
- c) the specific gravity;

- d) the net weight of the package (ounces, pounds, pints, quarts, gallons, and the metric equivalent);
- e) instructions for using the product (including amount to use, spray calendar, and restrictions as to use);
- f) mention of all serious risks involved in the handling, display, distribution, and elimination of the product;
- g) directions for first-aid and care to be given in emergencies;
- h) other pertinent information and cautionary remarks.

The five minutes or so it takes to read the label are the most important ones from the standpoint of good weed control.

4. Quantity to use

It is very important to follow the recommendations of the Quebec Crop Productions Board ("C.P.-V.Q.") in order to know the quantities to use. The rate of application recommended is the most effective one that can be used without causing major damage to the crop. In the case of herbicides with residual effects it is necessary to take into consideration the crop which will follow the one to be treated before deciding on the dose to apply. In a field which is to be sown to corn for the last time in a rotation (or otherwise) not more than 1½ pounds of atrazine per acre should be applied; sugar beets in particular are susceptible to these residues.

5. When to apply herbicides

For most herbicides there are fairly precise periods when they must be applied if they are to be effective against the weeds without damaging the cultivated plants:

- a) **Incorporated pre-seeding:** these are treatments which must be applied before seeding to well-tilled soil whose surface (upper half-inch) is dry. The herbicide must be incorporated with the top four inches of the soil with a disk followed by a toothed harrow, within five minutes of being applied, otherwise its weed-killing effectiveness will be lost. For this reason the width of the sprayed strip must not exceed that of the harrows.
- b) **Pre-emergence:** herbicide sprays of this type are applied after seeding but before the crop plants or the weeds emerge. The soil must be in good tilth (not lumpy). The herbicide treatment should be applied to it immediately after seeding in case subsequent rains delay seeding and, at the same time, cause the weeds to germinate and grow, so that the treatment is ineffective.
- c) **Post-emergence:** these are herbicide sprays applied after the crop plants and the weeds have come up. It is important to apply the spray at the recommended stage in the growth of the crop plants (generally when the first leaves appear). At that time, the weeds are very vulnerable to the herbicide, whereas the crop is resistant

to it. Any delay thereafter in spraying is dangerous because the vulnerability and resistance of the plants to these chemicals varies with their age.

6. Calibrating the sprayer

The sprayer must be able to apply evenly a known volume of spray per acre. Manufacturers usually provide a table showing the output of their sprayer (i.e. the number of gallons of spray it will apply per acre according to the calibre of the nozzle used, the pressure, and the speed of travel). Nevertheless, it is advisable for the operator to check periodically the volume of spray his sprayer is actually delivering per acre.

All the nozzles should have the same rate of discharge. Any of them having a discharge rate differing by more than 10 per cent from the rest should be discarded. For comparison, a new nozzle should be inserted among the set.

Different nozzles must be used depending on whether a liquid herbicide or a wettable powder is to be applied (e.g. Tee Jet nozzle No. 8002 for liquids and No. 8004 for wettable powders).

The jets of spray should not emerge from the spray boom at too wide an angle otherwise they will overlap and, where they do so, the soil will receive too much spray.

The output of the sprayer will stay uniform as long as the pressure and speed of travel are kept steady.

7. Spraying

Spraying should be done at low pressure (50 pounds or less) and in calm weather in order to avoid damage to neighbouring crops from drifting spray.

The liquid in the spray tank should be agitated constantly if wettable powders (e.g. atrazine) are used, so that the herbicides remain in suspension.

If you are thinking of spraying from the air (by plane), find out first whether surrounding crops are susceptible and spray at low altitude and in very calm weather.

Sprayer maintenance

The output of many sprayers is seriously affected by corrosion and lack of attention. Filters should be cleaned often and nozzles should be replaced as soon as the circumference of the nozzle shows wear. If possible, use tempered stainless steel nozzles as they are more resistant (see table 3).

TABLE 3.

Durability of nozzles of different materials (compared with that of copper taken as 1)

Copper.....	1
Plastic.....	3
Stainless Steel.....	19
Tempered Stainless Steel.....	77

Immediately after applying each spray, clean thoroughly the inside of the spray tank, the pump, the piping, the nozzles, etc. as follows:

- completely empty the spray tank to get rid of the remaining spray;
- fill the spray tank with water and run the sprayer for five to 10 minutes;
- empty the tank again and then fill it with a cleansing solution (one pound of household ammonia powder and one cup of detergent powder per 25 gallons of water);
- run the sprayer again for five to 10 minutes and leave the rest of the solution in the sprayer for 24 hours;
- run the sprayer for five to 10 minutes and then empty it completely.

At the end of the season, remove the nozzles, strip them down and put all the parts into an anti-rust solution or motor oil. Completely drain the pump to prevent damage from freezing. Follow the manufacturer's instructions regarding storage.

9. Temperature

The ideal temperature for spraying is 20 to 26°C (70 to 80°F). Lower or higher temperatures than these reduce the effectiveness of the herbicide.

10. Organic matter

In some cases, pre-emergence and incorporated pre-seeding herbicide treatments are more or less ineffective on soils which have an organic matter content over eight per cent or have been given heavy applications of manure. This is because the herbicide is quickly "fixed" and loses its effectiveness.

For further information about weed control, herbicide use, and calibration of sprayers, the local agronomist should be consulted. Successful weed control is dependent upon the above-mentioned factors; it is up to the farmer to do what is required to increase his profits. The means are at hand.

QWI

National Convention

Over 500 Women's Institutes members from across Canada will meet in Charlottetown, Prince Edward Island, this month for the seventh National Convention of the Federated Women's Institutes of Canada. The convention, to be held June 20 to 25 at the University of Prince Edward Island, will have the theme FOCUS — Facing our Challenge — Unity is Strength. Mrs. John McLean, of Eureka, Nova Scotia, President of the national organization, has announced that Mrs. Olive Farquharson, President of the Associated Country Women of the World, will be the guest speaker at the official opening, to be held at Confederation Center, Sunday evening, June 20th. Mrs. Farquharson, from London, England, will also chair a session on ACWW later in the week.

Other speakers to be heard during the week are Mrs. Agnes Higgins, Director of the Montreal Diet Dispensary, and Mrs. Novia Carter, Associate Professor, Division of Urban and Regional Planning, School of Architecture, University of Waterloo. Mrs. Higgins' topic will be Nutrition, based on the work being done at the Diet Dispensary, particularly the work with pre-natal nutritional requirements. Mrs. Carter's topic will be "Volunteers and Voluntary Organizations; are they obsolete?"

FWIC conveners will present a symposium dealing with the results of the nutrition program and others conducted during the past three-

year term. There will also be discussion and study groups on current issues and concerns: strengthening the family unit, urban rural communications, and our heritage.

The delegates will be given a day's tour of 'The Island' and will be guests of the province of Prince Edward Island at a dinner on the last evening of the convention. The Confederation Boys Choir will sing at the Opening Ceremonies, and a Convention Choir, made up of WI members and their families, will sing during the week.

The work of the Women's Institutes across Canada will be presented during a "Meet the Provinces" session. Business sessions will also be held through the week and new officers elected.

A Very Special Occasion

Although we are well into summer activities, the members of our branch still look back with a feeling of well being to one special winter's day. Citizenship involves the entire community, but foremost among the interests and projects of the W.I. groups are the children and elderly of their own community.

One such project of the **Milby** W.I. (Sherbrooke) was the Christmas tree and hot dish supper for the members' families of the Ives Hill Community. The success of this project was largely because of the able management and convenership of Mrs. Carolyn Coates and Mrs. Mildred Cairns.

By late afternoon of December 14,

the hall, festive with streamers, flowers, candles, and Christmas lights, was filled with the chatter of friendly folk and laughing excited kiddies. Colourful Christmas tablecloths, napkins, candles, and vases of flowers adorned the two long tables already set and awaiting the hungry comers. Members and parents served the younger children from the side table laden with goodies — a great variety of casseroles, salads, homemade rolls, pickles, and ice cream and cake for dessert — all furnished by members and friends.

After the tables had been cleared, several talented members of the younger group entertained with a program of group carol singing, guitar, piano, and vocal duets and solos, including a solo in French. There were recitations and Bible readings, and, last but not least, a humorous reading by one of the W.I. members, all of which were greatly enjoyed by everyone.

Suddenly the "Man of the Hour" burst into the hall with the noise of sleigh bells and a hearty "Ho! Ho! Ho!". From the lovely tree in the corner of the hall, Santa distributed gifts and a bag of candy to every child, after which the happy gathering broke up, one and all leaving with the echoes of "Merry Christmas" ringing in their ears and in their hearts a warm, friendly feeling because a small group of dedicated W.I. members cared.

Argenteuil Activities

The Guatemala earthquake left a lot of people homeless and in need of aid. **Arundel** members showed their concern in a very practical way — they held a successful 500 card party and raised \$112 which was sent to the Guatemala Relief Fund. The branch celebrates its 30th Anniversary this year, and a dinner is planned to celebrate it.

Mrs. Gertrude Seary of **Brownsburg** was the happy recipient of a 50-year pin at their April meeting. The members brought in articles that had belonged to parents or grandparents and the "heirlooms" provided a great deal of interest. They are busy making handi bags for CanSave.

An old rusty farm implement gave the **Dalesville-Louisa** WI a lot of fun when they were asked to guess what it was. A prize of a potted plant went to June Morrow who's guess was the nearest (a plant setter). The program at the meeting was a showing of slides depicting the four seasons. An authentic touch to the spring slides was a tape recording in the background of frogs singing.

Lakefield WI takes a keen interest in the Douglas Hospital. A letter of appreciation from the hospital was read at their last meeting. Fun was had after the meeting with an afternoon of bingo with prizes. Concern has been shown about the sex literature and the quality of TV programs that seems to be pushed at us these days. **Frontier** WI passed a motion to complain about this in the hopes that the situation might be improved.

Each member had invited a senior citizen to their meeting, as a guest. One lady, Mrs. Wm. Whitham, who is 88, quoted a poem which she had learned as a child from her mother. It is still valid today.

"This world is a different riddle,
And how many people you see
With faces as long as a fiddle
That ought to be shining with
glee.

I'm sure in this world there's
plenty
Of good things, enough for us
all;
And yet, there's not one out of
twenty,
But think that their share is too
small.

So, what is the use of repining,
For where there's a will there's
a way;

Tomorrow the sun may be
shinning,
Although it is cloudy today."

1976 is the centennial year for the municipality of Grenville. It is hoped that with the interest and help of the whole community a community hall will be built. The Grenville Institute is doing its part in this. An interesting account of the history of the district was given at their meeting by the Rev. W. Vanas.

Miss Vic. Larose was a recent guest speaker at a **Jerusalem-Bethany** meeting. Her subject was "heart disease and prevention of same". A project of this branch is for two members to visit the Manoir at St. Phillippe, a residence for seniors, every month and take "goodies" to the residents. This is a double blessing as it cheers the visited and makes us realize how fortunate we are to be still active and well.

Our sympathies go to the Leggett family on the death of Mrs. Geo. Leggett. Mrs. Leggett had been a member of the **Lachute** WI and will be sadly missed.

Mr. Wendall Roberts, a retired teacher from the Lakeshore, was a recent speaker at Lachute, his topic being "The real goal of Education never changes." An interesting and lively question period followed which kept Mr. Roberts busy with answers.

Old photographs of early WI activities and members are wanted for a County scrapbook. These scrapbooks make interesting reading and keep us informed of early day activities. They also show use changes in fashion and most of all, changes in prices!

It is gardening time. So many more people seem to be gardening these days. Whether you live in a suburban home or a one-roomed apartment, whether you prefer city bustle or country peace and quiet, plants can be grown and become part of your life. If you don't have garden space, you can grow your vegetables and flowers in pots or window-boxes. **Pioneer** members were looking forward to their annual plant sale in May where they buy that "something extra" for their flower beds.

At a meeting of the **Upper Lachute** WI Mrs. Ann David was a speaker, choosing as her topic the work of the Cancer Society. She stressed the importance of an annual medical check-up for everyone. Cancer in its early stages is nearly always curable. Her talk was a most interesting and informative one.

Lachute Fair is the big thing in the County every year and members are planning exhibits and a donation was given to the Agriculture Society for the Spring Fair Exhibit.

There is a small, but very nice, museum in the County at Lachute. This year, with the high water levels in the spring, concern has been expressed for the water damage done to the museum. What the solution for this can be is difficult to say. But it is hoped that something can be done.

Correction

In the April Journal we said that Dunham held their meetings in the Dunham Ladies College building; this is not correct. The members meet in one another's homes. The group, "Youth With a Mission", that uses the college buildings was the subject of Miss Watson's talk. Sorry! We got this mixed up.

Stanstead Happenings

We are very fortunate to have so many ways of communication here at the Border. Three newspapers serve us; two radio stations plus one in Montreal offer free time for announcements, and WIKE in Newport, Vermont permit live broadcasts by Miss Viola Moranville of the **Beebe** branch. Miss Moranville made 16 broadcasts this past year.

The five branches all assist with the Ayers Cliff tea room, with donations of food and articles to the sale tables, and with working. This is an important fund raising event for the County.

All the branches participate in the annual school fair. In 1975 it was a two-day affair. This was on trial but it proved to be so successful it will continue for this year and perhaps for the future.

Ayers Cliff have adopted a foster child through the Save the Children Plan.

Beebe WI made flowers and sold them for Mother's Day. One of

their members, Mrs. H. S. Beane, a charter member of the branch received an Abbie Pritchard mohair throw.

A favourite annual event for the **Hatley** branch is the May fair in the village hall. It is always well attended by County and local people.

The Mansur schoolhouse has now become a museum and the **Stanstead North** branch are custodians. They held their annual fall dinner there, and it was a great success. The schoolhouse was built in 1819 and has been changed very little from its original one-roomed building. From an historical viewpoint, this is a very interesting building both inside and out, and the annual dinner opens the doors of this building to the public.

Dear WI Members,

When we are asked by non-members "What does the WI do?", we are somewhat at a loss to know what to say first! As we are nearly all country women and our aims and problems are similar many of us do the same things.

All of us are concerned for our older citizens. They have worked hard in the past and contributed much to their communities. Now that many of them cannot take part as before, they tend to feel useless and forgotten. It is wonderful to know that WI members visit them in their homes, in hospitals, and senior citizens' residences, providing them with cards, sunshine baskets, gifts, homemade cookies and jams. The Wales Home in **Richmond County** and the Walshaven Apts. in **Huntingdon County** are only two examples of where WIs visit, hold occasional meetings, provide wool for knitting, and favours for special occasions. Younger members drive older ones to meetings; those with cars and time take the seniors in the communities for drives or shopping.

Besides care for older people, members are vitally interested in children — in their education and their welfare. Many branches sponsor school fairs and gardens. Seeds are ordered and programs prepared. Some branches help with school lunch programs and help prepare and serve meals. Many contribute to scholarship funds — **Black Cape** WI gave a \$200 bursary to one student and \$100 to another local student studying in Ontario.

Teachers have been invited to speak to WI groups. One branch in **Shefford County** heard a teacher of 20 years speak on her work and the many changes in education. **Fordyce** members visited a local elementary school recently and were shown new methods of education and heard the principal, Mrs. Macdonald, speak on teaching children to read. Mrs. Stuart Hawke, teacher from Massey Vanier School was a guest at the **Stanbridge East** meeting and spoke on "The Slow Learner", demonstrating some of the material used in teaching and showing slides of her class at work and play. **Chateauguay-Huntingdon** sponsored a Public Speaking contest in four of the County's Elementary Schools.

WI members are interested in charitable organizations. Many knit for Canadian Save the Children. Nearly everyone fills handi bags for CanSave. A contest for the most eye-catching bag was held in **Dennison Mills** resulting in nearly 30 being handed in, many of these were made by the young people in the community. **Richmond Hill** branch brought in 60 bags.

The Heart Fund, Salvation Army, local hospitals, Guatemala Relief were all supported. **Gore** ladies do magnificent work for the Cancer Society and last year provided 7,015 dressings, 59 cancer shirts, 24 pairs of bed socks, two bed

jackets, and various cottons. Douglas Hospital "Forgotten Patients" were remembered for Easter. Our Institute funds were supported, i.e. Pennies for Friendship and the Education/Nutrition funds.

We were active in our communities in many ways. A local family whose home was destroyed by fire received a quilt from the **Richmond** WI and **Bury** made a donation to a couple who had been severely injured in a car accident. Another group served a lunch after a funeral and others plan to plant flowers in their villages to help beautify them for the summer.

Beside "doing" for others we like to learn new things. Demonstrations are popular whether they are for crochet, quilting, or flower arranging. **Ormstown** WI held their last meeting at a district flower shop. They saw a demonstration of flower arranging, making a terrarium, and a hanging basket. A drawing for a cut-flower arrangement and potted plants added to the interest. After the demonstration they enjoyed tea served by the florist and his wife and each member, on leaving, was presented with a red carnation. This was a most enjoyable meeting and after a cold and snowy winter the flowers and plants were so fresh and beautiful to everyone.

A cake decoration demonstration by Mrs. C. Mastine was enjoyed by the **Cleveland** members. Mrs. Mastine explained how a few candies, pipe cleaners, and small toys could be used to effectively decorate cakes for children. She showed how to cut a cake to resemble a baby carriage. Using two cakes she also showed how they could be decorated in different ways using roses made ahead of time in order to be firm enough to hold their shape.

With the garden season soon to

be with us, **Howick** members were most interested in ideas to double the yield of their gardens: use every inch of space, stagger rows, plan your plantings, water the soil, not the air; mulch and be ruthless with weeds, etc. **Brookbury** heard a talk on growing plants and vegetables in a greenhouse.

Contests and quizzes enliven a meeting and some that were mentioned were: jumbled word contest of spices and edibles found in one's cupboard; quiz on different soaps; know your public, in which pictures of public figures were numbered and displayed with the winner being the one who recognized the most; tree guessing game; quiz on woman of the year, and a contest — "unscramble the scrambled clichés".

All is not just work among our membership; we have fun, too. **Matagami** had a singsong for members and friends with Mrs. Daptuck accompanying them on her guitar. For a change they sang the Opening Ode to the tune "Amazing Grace" which was enjoyed by all.

Spooner Pond enjoyed a social evening arranged by their ways and means committee. Two of their members in a home recently received mohair throws from the Abbie Pritchard Fund. This branch has a collection for Pennies for Friendship at each meeting.

Branches have exchanged visits and County presidents have been entertained. **Inverness** enjoyed a talk on a recent Florida trip by Mrs. Dempsey.

For all our activities we need funds, of course, and these are raised in various ways. The most popular ways being card parties, catering for banquets, and sales of articles and food at teas, bazaars, and meetings.

Some of us are celebrating special

anniversaries this year. **Grand Cascapedia** is 25 and **Dunham**, our first Quebec branch, is 65 years old this year. They will be celebrating this even later in the year. This branch has five new members, two of whom are teenagers. Welcome all to WI.

The third printing of the Apple Cookbook compiled by the **Hemmingford** WI is now ready. We regret that due to increased costs for paper, etc., the price has been raised to \$1.25 per copy.

Begonia bulbs were given out to members of **Richmond Hill** branch by the Agriculture Convener and the results will be judged in September.

Richmond Young Women enjoyed a "make-believe tea" sponsored by a local Brownie group. Each person bought an envelope which contained a napkin and a tea bag and instructions as to when to make the tea so that everyone could enjoy it at the same time and "make believe" they were having a tea party!

Mrs. Conrad Pariseau of **Richmond Young Women** WI was presented with a Life Membership pin. Seven members had perfect attendance and each received a cup and saucer.

Dennison Mill young people do their bit to cheer the elderly by making place mats from colourful construction paper and used Christmas cards. These are sent to a local Home where they are used to brighten up the meal trays.

Mottoes

"A person who remembers what he was taught at his mother's knee was probably bent over it."
"Courage is what it takes to stand up and speak; courage is also what it takes to sit down and listen."

Mrs. J. Robertson
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